doubtedly is by comparison with the Sun's, have been observed to occur more frequently when the Moon is in perigee; and Sir John Herschel has explained the predominance of active volcano and earthquake regions along shore-lines as depending on the seemingly insignificant changes due to tidal action. How much more, therefore, might we expect that the solar equilibrium would be disturbed by planetary action, when all that has been revealed respecting the Sun tends to show that the mightiest conceivable forces are always at work beneath his photosphere, one or other needing only (it may well be) the minutest assistance from without to gain a temporary mastery over its rivals. And if, as recent observations tend to show, the mightiest of the planets sympathises with solar action,—if when the Sun is most disturbed the belts of *Jupiter* are also subject (as of late and in 1860) to strange phenomena of change,—how readily do we find an explanation of what would otherwise seem so mysterious, when we remember that, as *Jupiter* disturbs the mighty mass of the Sun, so the Sun would reciprocally disturb the mass of the largest of his attendant orbs."

*Brighton, September*, 1871.

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## *Observations of Saturn, Mars, &c.* By Rev. J. Spear.

I am sorry I have not been able to record any observations of importance, except perhaps the error in the calculation of the occultation of $\zeta$ *Tauri*. I send, however, the following, which may, of course, be used as the Society may think fit.

Place of observation at the following dates mentioned herein :

| | |
|---|---|
| Latitude | $30^{\circ}\ 42'\ 4''$ |
| Longitude | $5^{h}\ 11^{m}\ 42^{s}$ E. |
| Elevation | 6603 feet. |

*June 13th*, 1870. Observed occultation of *Saturn* by the Moon. Definition *excellent*. The Moon passed steadily over the planet without causing any change of form, or giving *any* indication of the planet's light passing through an atmospheric medium. The planet, when near the Moon's limb, assumed a "sickly green hue," according to a note I made at the time, and which I saw corroborated in the *Monthly Notice* afterwards.

*Nov. 9th*, 6.30 A.M. Observed *Mars*. Phase gibbous. Snow and ice on the north pole, *intensely bright and glistening*. P. 240. Aperture $4\frac{1}{4}$ inches. *Jupiter*, at the same time, appeared covered with belts, the equatorial belt, of ochreish colour (inclining to brown), was marked with spots and lines of bright light. There were several broken belts, both north and south; one on the south running in a diagonal direction.

16*th.* Observed two diagonal markings on the equatorial belt, also stiplings of bright cloud. The brightness of these floating clouds was very striking. The light earthy colour of the Great Belt seems to preclude the notion of the planet's still giving out any light of itself.

*Dec.* 6*th.* Observed the light yellow colour of the belts and satellites of *Jupiter.*

*Dec.* 8*th.* Watched for the occultation of ζ *Tauri*, Greenwich mean time of apparent conjunction in right ascension of Moon and Star, $5^h\ 0^m\ 3^s$. Limiting parallels, N. 90—N. 19. Lat. of place of observation, 30° 42′ 4″. No occurrence. The Moon passed at least 10′ north of the star to the best of my judgment.

Telescope used $4\frac{1}{4}$ in. by Cooke and sons. Defining power excellent. By using a Barlow lens, and thus more than doubling its powers, it has separated ε *Arietis*, also shown the faint companion of ϰ *Geminorum*, test-objects for a 6-inch telescope.* "Good nights" are not very frequent, except in the cold season. Scintillation of stars within about 12° degrees of the horizon, is very considerable, even at my present elevation, about 7300 feet.

I fear there is nothing else in my notes worth communicating. I have not been able to obtain a good view of *Venus* lately, owing to the heavy fogs. The terminator appears irregular.

P.S.—Place of observation at present :—

| | | | |
|---|---|---|---|
| | ° | ′ | ″ |
| Latitude | 30 | 42 | 49 |
| | h | m | s |
| Long tude | 5 | 11 | 42 |

Elevation about 7300 feet.

*Churkrata, N. W. Provinces, Bengal.*
*July* 12*th*, 1871.

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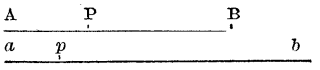
## *Hyperbolic and Napierian Logarithms.*

By Prof. A. D. Wackerbarth.

In almost all the elementary works—English, French, and German—which we make use of in teaching mathematics, the *natural* or *hyperbolic* logarithms are stated to be identical with the *Napierian*. But this is far from being really the case, and the difference is indeed fully stated in the introduction to Hutton's *Tables*. The highly gifted nobleman who invented logarithmic calculation defines his system thus :

Let a point *p* move with uniform velocity from *a* along the indefinite line *a b*, while another point P simultaneously moves from A along the finite line A B with a velocity proportional to P B, then is *a b* the logarithm of P B.




* This is dated Jan. 26th, 1871.